

# **Product Lifecycle Management and the Quest for Sustainable Space Exploration Solutions**

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## **Abstract**

Product Lifecycle Management (PLM) is an outcome of “lean” thinking to eliminate waste and increase productivity. PLM is inextricably tied to the systems engineering business philosophy, coupled with a methodology by which personnel, processes and practices, and information technology combine to form an architecture platform for product design, development, manufacturing, operations, and decommissioning. In this model, which is being implemented by the Marshall Space Flight Center (MSFC) Engineering Directorate, total lifecycle costs are important variables for critical decision-making. With the ultimate goal to deliver quality products that meet or exceed requirements on time and within budget, PLM is a powerful concept to shape everything from engineering trade studies and testing goals, to integrated vehicle operations and retirement scenarios. This briefing will demonstrate how the MSFC Engineering Directorate is implementing PLM as part of an overall strategy to deliver safe, reliable, and affordable space exploration solutions and how that strategy aligns with the Agency and Center systems engineering policies and processes.

Sustainable space exploration solutions demand that all lifecycle phases be optimized, and engineering the next generation space transportation system requires a paradigm shift such that digital tools and knowledge management, which are central elements of PLM, are used consistently to maximum effect. . Adopting PLM, which has been used by the aerospace and automotive industry for many years, for spacecraft applications provides a foundation for strong, disciplined systems engineering and accountable return on investment. PLM enables better solutions using fewer resources by making lifecycle considerations in an integrative decision-making process.